SPIXIANA	15	2	197–205	München, 30. Juni 1992	ISSN 0341–8391

On the genus *Polypedilum* Kieffer, 1912 from Lebanon. Description of three new species

(Insecta, Diptera, Chironomidae)

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Moubayed, J. (1992): On the genus *Polypedilum* Kieffer 1912, from Lebanon. Description of three new species. (Insecta, Diptera, Chironomidae). – Spixiana **15/2:** 197–205.

Species of the genus *Polypedilum* known from Lebanon are briefly summarized. Description of three new species of *Polypedilum* is given with comments on their ecology and taxonomic position.

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Introduction

According to Moubayed & Laville (1983), Moubayed (1987, 1988), Moubayed & Dia (in course of publication) thirteen species of *Polypedilum* are hitherto known from Lebanon. Six species belong to *Polypedilum* subgenus: *P. albicorne* (Mg.), *P. convictum* (Walk.), *P. cultellatum* G., *P. laetum* (Mg.), *P. pedestre* (Mg.) *P. pseudamoenum,* spec. nov., two to *Pentapedilum* subgenus: *P. nubens* (Edw.), *P. longisetum*, spec. nov. and five to *Tripodura* subgenus: *P. anjarum* Moub., *P. quadriguttatum* K., *P. scalaenum* (Schr.), *P. sidoniensis* Moub. and *P. yammounei,* spec. nov.

Among all these species only status of both *quadriguttatum* and *scalaenum* needs to be discussed. These two closely related species can easely be separated by the combination of the shape of anal point (lateral lobe) and wing markings pattern (Pinder 1980, Rossaro 1984). Variation in lateral lobe of anal point could often be with a source of error. Wing markings are regularly present and allow a well definitive identification. Thus, specimens examined from intensive search in Lebanese rivers has shown that only *quadriguttatum* occurs in this area. However specimens recently collected in western Anatolia (Egridir Lake, Turkey) belong also to *quadriguttatum*.

Descriptions

Description of *P. (Pentapedilum) longisetum,* spec. nov., *P. (Polypedilum) pseudamoenum,* spec. nov. and *P. (Tripodura) yammounei,* spec. nov. is given on the basis of the following references: Kieffer (1922), Goetghebuer (1937), Townes (1945), Freeman (1958), Hirvenoja (1962), Albu & Botnariuc (1966), Lehmann (1971, 1979, 1981), Pinder (1978), Ashe (1980), Ashe (1981), Rossaro (1984), Pinder & Reiss (1986), Cranston & al. (1989), Langton (1991). Morphological nomenclature follows Saether (1980).

Polypedilum (Pentapedilum) longisetum, spec. nov.

Type material. Holotype: 1♂ imago, loc. typ. potamal of Litani river at Jib-Jannin, alt. 800 m, 16/V/82. – Paratypes: 41 ♂♂ imagines, same data as holotype, 10/V/82; 2♂♂, Ammik swamps, alt. 850 m. 16/V/82; 8♂♂ including the holotype, are deposited in Coll. Zool. Staatssammlung München.

Male imago (n = 5)

Total length 3.55–3.65 mm. Colour entirely brown, haltere brownish. Head with 12–14 setae, 5–6 orbitals and 6–7 outer verticals. Antenna 1110–1135 μm long, last flagellomere 752–766 μm long, AR 2.05–2.25. Thorax with 25–27 acrosticals, 5–7 prealars and 22–24 scutellars. Wing 2.30–2.40 mm long, brachiolum with 2 setae, Sc 18–19, R 40, R1 23–34, R2+3 0, squama 7–12; membrane with macrotrichia. Legs, tibial spurs on P2 (1), P3 (1) straight, elongated and subequal in size (59–67 μm long); lengths (μm) and proportions of legs as follows:

	fe	ti	ta1	ta2	ta3	ta4	ta5
P 1	883– 905	584– 608	1010–1074	679–696	496–509	371–382	178–185
P 2	1015–1056	892–949	518– 523	307–315	237–242	153–161	93– 98
P 3	1095–1157	989–1032	792– 806	431–447	362–374	203–227	107–110

	LR	BV	SV	BR
P 1	1.73–1.77	1.44–1.46	1.41–1.45	2.80–3.00
P 2	0.55–0.58	3.07–3.10	3.68–3.43	2.30–2.50
P 3	0.78–0.80	2.59–2.61	2.63–2.72	4.00–4.60

Hypopygium (Fig. 1), tergite IX with 17–19 central stout setae and 18–23 basal setae, basal setae are shorter than the centrals. Anal point 50–57 μm long, rounded distally, parallel-sided, reaching the tip of inferior volsella, bent near the middle in lateral view (Fig. 2). Superior volsella generally straight (curved distally in some specimens), base with macrotrichia and 4 inner stout setae; lateral seta 125–150 μm long, inserted halfway along superior volsella and overreaching the half of gonostylus. Inferior volsella 140–150 μm long, parallel-sided, with 8–10 setae distally. Gonostylus slightly swollen medialy and not uniformly tapering to tip; inner margin with 6–7 setae. Gonocoxite with 2–3 setae laterobasally, inner basal margin with 4 stout setae.

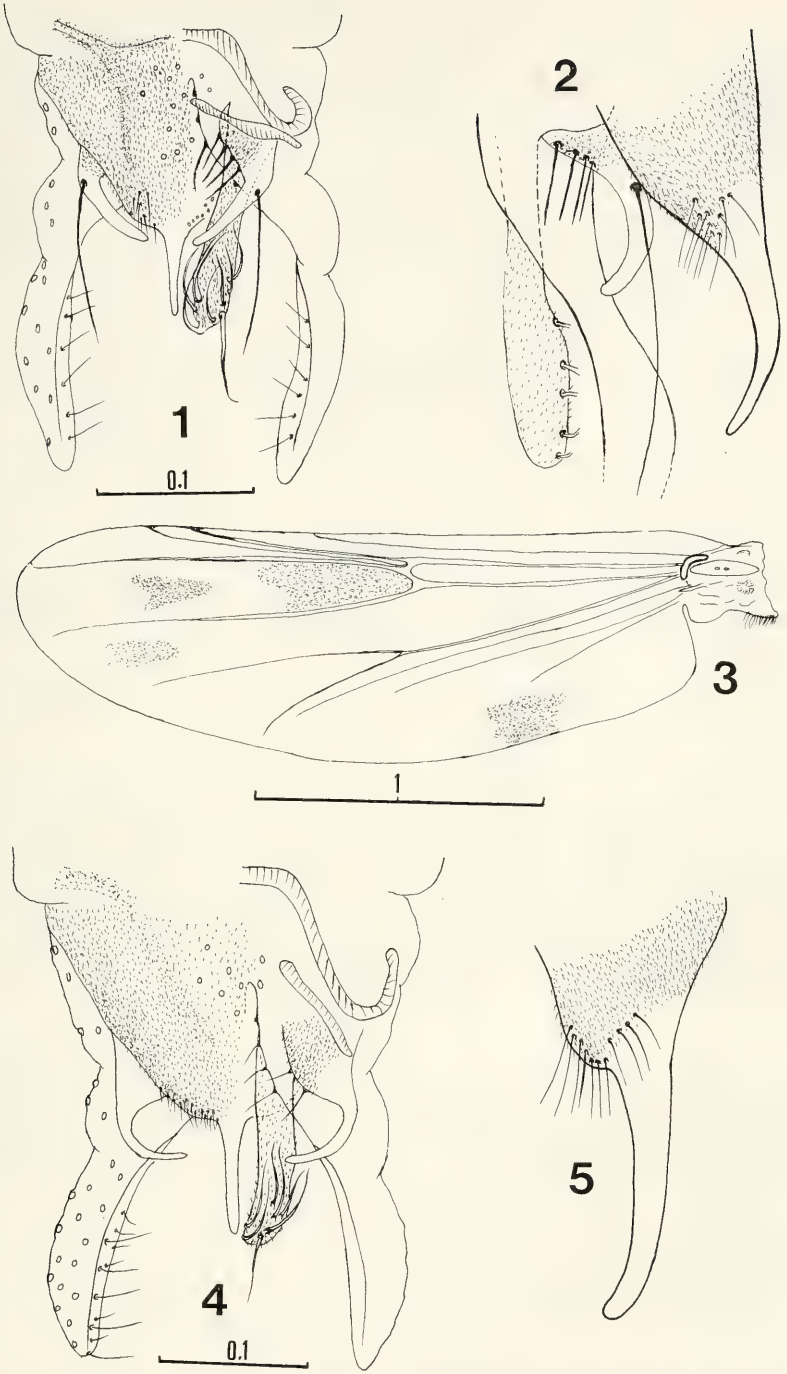
Larva and pupa unknown

Remarks: *P. longisetum*, spec. nov. is placed near *P. tritum* (Walker) and *P. uncinatum* (G.). It is especially characterized by its hight antennal ratio value (AR >2) and the shape of its anal point. However, in one hand, anal point of *tritum* is slightly constricted medialy and somewhat expanded distally, and in another hand lateral seta is rather inserted two-thirds of the way along superior volsella of *uncinatum*.

Key to male adults of the *tritum-uncinatum*-group

1. Lateral seta inserted about two-thirds of the way along superior volsella ..... 2.
– Lateral seta inserted at least halfway along superior volsella ..... 3.
2. Anal point parallel-sided proximally and somewhat pointed at tip, AR < 2 .. *P. tritum* (Walker)
3. Anal point both slightly constricted medialy and expanded distally, AR < 2 ..... *P. uncinatum* (G.)
– Anal point parallel-sided, not pointed apically, AR > 2 ..... *P. longisetum*, spec. nov.

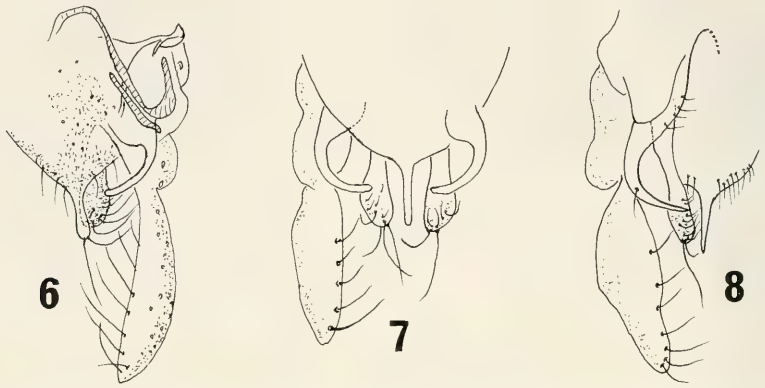
Ecology and distribution. Potamal and swamps of the Litani river drainage basin (Bekaa province), Anjar, Ammik, Jib-Jannin. Emergence in April May.



Figs 1–5 *Polypedilum (Pentapedilum) longisetum,* spec. nov., male imago: hypopygium in dorsal view (1) and in lateral view (2). *Polypedilum (Polypedilum) pseudamoenum,* spec. nov., male imago: wing (3), hypopygium (4), anal point in lateral view (5). Scales in mm.

Polypedilum (Polypedilum) pseudamoenum, spec. nov.

Type material. Holotype: 1 ♂, loc. typ. the river Damour at El-Kady bridge, alt. 260 m, 04/VII/81. – Paratypes: 2 ♂♂, Beirut river at Baalechmay, alt. 700 m, 10/III/82; 4 ♂♂, Awwaly river near Saida, alt. 50 m, 30/III/80. 2 ♂♂, including the holotype, are deposited in Coll. Zool. Staatssammlung München.



Figs 6–8 Hypopygium of male imago of *Polypedilum amoenum* (G.) (6, after Albu 1980, Fig. 137), *P. bifalcatum K.* (7, after Kieffer 1922, Fig. 36), *P. ? bifalcatum* K. (8, after Freeman 1958, Fig. 4a).

Male imago (n = 6)

Well sized species, total length 4.3–5.2 mm. Coloration brownish to yellowish brown, haltere pale. Head with 12–13 setae, 7 outer verticals, 3 postoculars and 5 inner verticals. Antenna 868–1124 μm long, last flagellomere 525–620 μm long, AR 1.45–1.50. Thorax with 28–30 prealars and 28–29 scutellars. Wing (Fig. 3) with 4 distinct darkened spots: 2 in cell r4+5, 1 in cell m1+2 (distally) and 1 in cell an (basally); wing length 2.75–3.00 mm; brachiolum with 2 setae, Sc 0, R 23–24, R1 20–21, R2+3 0, R4+5 40–43, squama with 14–19 setae; macrotrichia absent. Legs, tibial spurs on P2 (1), P3 (1) short, strongly bent distally and subequal in size (29–33 μm long); lengths (μm) and proportions of legs as follows:

	fe	ti	ta1	ta2	ta3	ta4	ta5
P 1	922– 977	806– 845	1037–1152	599–671	482–540	380–445	160–189
P 2	1090–1171	870– 979	540– 628	292–336	217–248	139–153	95– 98
P 3	1130–1228	1035–1075	806– 921	424–460	343–365	197–219	109–116

	LR	BV	SV	BR
P 1	1.29–1.36	1.62–1.71	1.58–1.67	3.0–3.6
P 2	0.62–0.64	3.33–3.36	3.42–3.63	3.5–6.1
P 3	0.79–0.86	2.77–2.78	2.50–2.69	4.6–5.4

Hypopygium (Fig. 4) wide and short. Tergite IX with 6–9 stout setae centrally and 28–30 fine setae on distal margin. Anal point 70–80 μm long reaching the tip of inferior volsella, parallel-sided, elongated and not pointed apically; in lateral view (Fig. 5) it is slightly bent distally. Superior volsella sickle-like, without lateral seta and not tapered, presence of 2 setae and microtrichia basally.

Inferior volsella 150–160 μm long, parallel-sided. Gonostylus short, 125–135 μm long; inner distal half of margin with 2 rows of setae. Gonocoxite with 4–6 setae laterodorsally, inner basal margin with 4 stout setae.

Larva and pupa unknown

Remarks. The *bifalcatum*-group is especially characterized in having a superior volsella sickle-like, without lateral seta and not pointed apically. *P. ? bifalcatum* K. (Fig. 8, sensu Freeman 1958: 291, Fig. 4a) seems to be an unrepresentative element of the *bifalcatum*-group; this species can be separated from the other species of the group in having: short and tapered anal point; superior volsella narrowed distally and bearing 1 seta laterally.

Key to male adults of the *bifalcatum*-group (excluding *P. bifalcatum* K., sensu Freeman 1958)

1. Anal point elongated and parallel-sided ..... 3.
2. Anal point short and rounded distally, inferior volsella expanded distally .... *P. amoenum* (G.), (Fig. 6)
3. Wing membrane unmarked, inferior volsella expanded distally, total length 2.5 mm .... *P. bifalcatum* K., (Fig. 7)
– Wing membrane with dark spots, inferior volsella parallel-sided, total length 4.3–5.2 mm .... *P. pseudamoenum,* spec. nov. (Figs 3–5)

Ecology and distribution. This species has been recorded only from the rhithral of coastal rivers of Lebanon, Damour, Awwaly and Beirut rivers.

Polypedilum (Tripodura) yammounei, spec. nov.

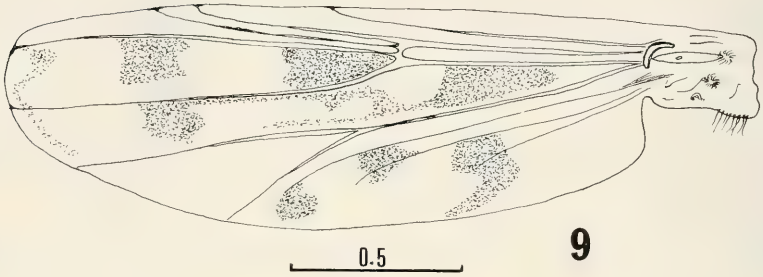
Type material. Holotype: 1 ♂, loc. typ. rhithral of Yammoune stream (Orontes basin), alt. 1350 m, 14/X/81. – Paratypes: 15 ♂♂, 4 ♂ pupae, 2 ♀ pupae, 31 ♂ pupal exuviae, 19 ♀ pupal exuviae, same data as holotype; 4 ♂♂, rhithral of Awwaly river, alt. 1080 m, 22/VII/80; 2 ♂♂, Yahfoufa stream (Litani basin), alt. 1200 m, 18/V/82; 7 ♂♂, 1 ♂ pupa, 6 ♂ pupal exuviae, and 6 ♀ pupal exuviae, including the holotype and some paratypes, are deposited in Coll. Zool. Staatssammlung München.

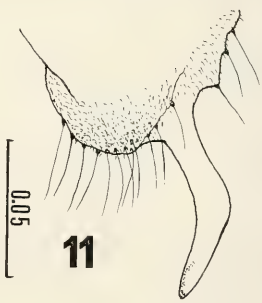
Male imago (n = 5)

Head and thorax brownish; Wing marked; legs brown yellowish, femur and tibia of P1, P2, P3 distinctly ringed; haltere pale. Total length 3.4–3.5 mm. Head strongly covered with macrotricha anteriorly, outer verticals 8–12. Antenna 850–930 μm long, last flagellomere 350–380 μm long, AR 0.75–0.86. Thorax with 17–19 acrostichals, 15–19 dorsocentrals, 5–7 prealars and 32–33 scutellars. Wing (Fig. 9) 2.30–245 mm long, with 8 dark spots: 2 in cell r4+5, 1 in cell m, 1 in cell m 1+2, 3 in cell an, and 1 finely expanded distally over cell r4+5 and cell m1+2; brachiolum with 1 seta, R 18–20, R1 12–16, R2+3 0, R4+5 38–40, squama 8–9; membrane with macrotrichia. Legs, tibial spurs of P2 (1) P3 (1) short, strongly curved distally and subequal in size 39–44 μm long); lengths (μm) and proportions of legs as follows:

	fe	ti	ta1	ta2	ta3	ta4	ta5
P 1	703– 778	533–584	902–941	535–562	389–423	287–314	141–153
P 2	862– 916	694–765	394–440	226–234	160–161	098–105	073–088
P 3	964–1007	796–843	599–630	301–323	248–264	153–161	088–102

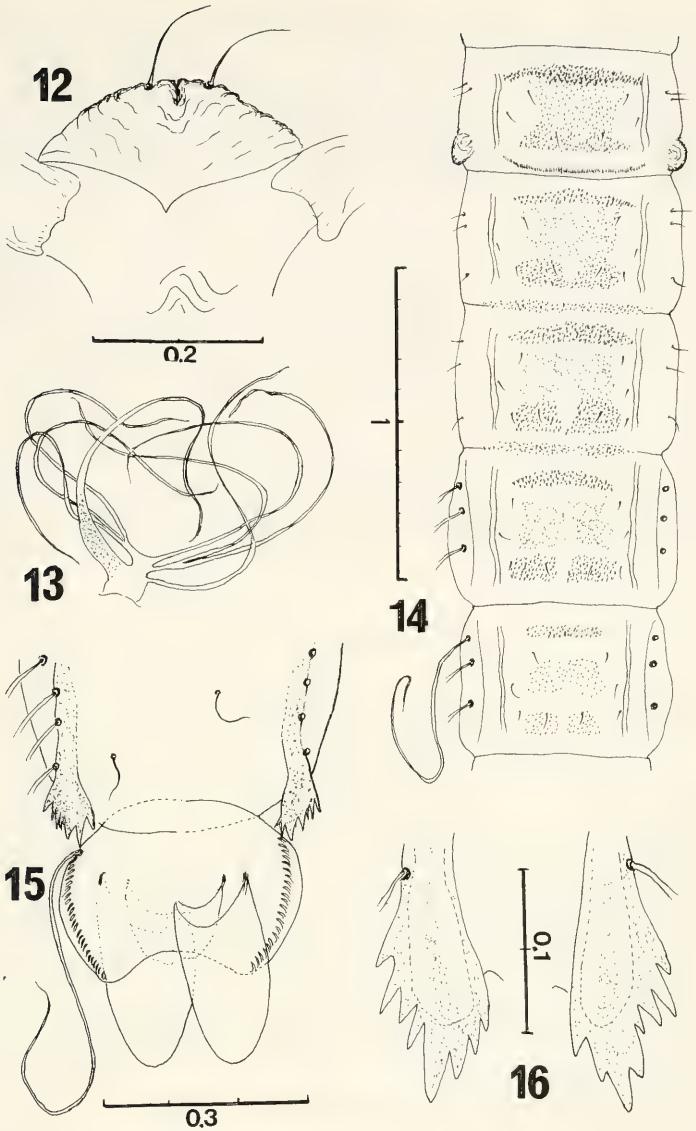
	LR	BV	SV	BR
P 1	1.61–1.69	1.58–1.61	1.37–1.45	2.48–2.53
P 2	0.57–0.58	3.49–3.61	3.82–3.95	3.69–3.76
P 3	0.75–0.76	2.92–2.99	2.93–2.94	3.39–3.47





Figs 9–11 *Polypedilum (Tripodura) yammounei*, spec. nov., male imago: wing (9), hypopygium (10), anal point in lateral view (11). Scales in mm.

Hypopygium (Figs 10–11), tergite IX with 16–19 central setae, distal margin horizontal and bilobed laterally, lateral lobes slender and pointed, distal margin bulged laterally as in figure 11. Anal point 70–75 μm long, slender, lanceolate, strongly bent medialy in lateral view (Fig. 11). Superior volsella 38–40 μm wide, pad-like, with 2 long basal setae (40–50 μm) and 5 short inner setae. Inferior volsella 135–145 μm long, parallel-sided. Gonostylus 180–195 μm long, slender, somewhat uniformly elongated and bearing 2 rows of inner setae distally. Gonocoxite with 2–3 setae laterodorsally, inner basal margin with 3 stout setae.



Figs 12–16 *Polypedilum (Tripodura) yammounei*, spec. nov., pupal exuviae: frontal plate (12), thoracic horn (13), tergites II–VI (14), abdominal segments VIII–IX (15), comb of segment VIII (16). Scales in mm.

Pupa (n = 5)

Thorax and abdominal segment VIII yellowish, comb of segment VIII golden-yellow, remaining parts whitish. Total length, ♂ 5.0–5.1 mm, ♀ 4.8–4.9 mm; abdomen, ♂ 4.0 mm long, ♀ 3.8 mm long. Frontal plate (Fig. 12) without tubercles, frontal setae 125–135 μm long, distance between setae 64–66 μm. Thoracic horn (Fig. 13) consists of 8–10 elongated branches, broadest branche spinulated at the base. Thorax with granulations (2–4 rows) on central suture; presence of 2–3 antepronotals, 2 precorneals and 4 dorsocentrals. Abdomen, setation on abdominal segments: fine LS setae on I–VI (0, 3, 3, 3), LS setae on V–VIII (3, 3, 4, 4). Armament on tergites II–VI as in

figure 14: row of hooklets on tergite II 40–45, no larger than anterior transverse field of spinules; conjonctives II/III and IV/V with continuos band of shagreen; medial and apical fields of point are distinct on tergites V and VI; apical field of point on tergite VI well separated into 2 small groups. PSB slightly proeminent, PSA present on sternite IV. Anal comb (Figs. 15–16) with 7–8 teeth divided into 3–4 teeth laterally and 4 apically. Anal segment (Fig. 15), fringe with 25–33 lamelliform LS, genital sac of male overreaching the anal lobe with 130–140 μm, anal lobe without dorsal seta.

Larva unknown

Remarks. Within the *Tripodura* subgenus from the Palearctic region several groups of species can be considered. *P. yammounei,* spec. nov. is placed near *elongatum, pullum, bicrenatum, quadriguttatum* and *scalaenum.* This new species can be separated from the others by the combination of the following characters: – Male imago, wing well marked, shape of anal point (in dorsal and lateral view) and its lateral lobes; – Pupa, absence of frontal tubercles, shagreenation of tergites II–VI.

Ecology and distribution. *P. yammounei,* spec. nov. inhabits springs (limnocrenal) and rhithral (habitats with low velocity) of lebanese rivers located in both Bekaa province (Orontes and Litani basins) and Mediterranean province (Beirut, Damour and Awwaly basins).

References

Albu, P. 1980. Fam. Chironomidae-Subfam. Chironominae. – Fauna Republicii Socialiste România. Insecta, Diptera, **11**(13): 1–320

–– & Botnariuc, N. 1966. Les Chironomidés de la rizière de Chirnogi (Oltenitza-Roumanie). – Gewäss. Abwäss., **41/42:** 48–63

Cranston, P. S., Dillon, M. E., Pinder, L. C. V. & F. Reiss 1989. The adult males of Chironominae (Diptera: Chironomidae) of the Holarctic region – Keys and diagnoses. – Ent. scand. Suppl. **34:** 353–502

Freeman, P. 1958. A study of the Chironomidae (Diptera) of Africa South of the Sahara. Part IV. – Bull. Br. Mus. Nat. Hist. Ent. **6** (11): 261–363

Goetghebuer, M. 1937. Tendipedidae (Chironomidae). Subfamilie Tendipedinae (Chironominae). A. Die Imagines. – In Lindner, die Fliegen der paläarktischen Region, **13**c: 1–138

Hirvenoja, M. 1962. Zur Kenntnis der Gattung *Polypedilum* Kieff. (Diptera, Chironomidae). – Ann. Ent. Fenn. **28:** 127–136

Kieffer, J. J. 1922. Chironomides de l'Afrique équatoriale. II° partie. – Annals Soc. ent. Fr. **91:** 1–72 + 4 Pl.

Langton, P. H. 1991. A key to pupal exuviae of West Palearctic Chironomidae. – P. H. Langton (Ed.), Huntingdon, Cambridgeshire, England, 386p.

Lehmann, J. 1971. Die Chironomiden der Fulda (Systematische, ökologische und faunistische Untersuchungen). – Arch. Hydrobiol. Suppl. **37:** 466–555

–– 1979. Chironomidae (Diptera) aus Fließgewässern Zentralafrikas (Systematik, Ökologie, Verbreitung und Produktionsbiologie), Teil I: Kivu-Gebiet, Ostzaire. – Spixiana, Suppl. **3:** 1–143

–– 1981. Chironomidae (Diptera) aus Fließgewässern Zentralafrikas, Teil II: Die Region um Kisangani, Zentralzaire. – Spixiana, Suppl. **5:** 1–85

Moubayed, Z. 1987. Complément à l'inventaire des Chironomidae (Diptera) du Liban. – Bull. Soc. Hist. Nat., Toulouse **123:** 51–52

–– 1988. Description of five new species of Chironominae (Diptera, Chironomidae) from near east and the oriental region. Xth Int. Symp. on Chironomidae, Debrecen-Hungary. – Acta Biol. Debr. Oecol. Hung. **2:** 275–283

–– & Laville, H. 1983. Les Chironomidae (Diptera) du Liban. I. Premier inventaire faunistique. – Annls Limnol. **19**(3): 219–228

–– & Dia, A. (in press). Les Chironomidae (Diptera) de deux rivières côtières du Liban méridional: le Damour et l'Awwali

Pinder, L. C. V. 1978. A key to the adult males of the British Chironomidae (Diptera), the non-biting midges **1/2** (37): 1–169 + 189 figs

–– & Reiss, F. 1986. The pupae of Chironominae (Diptera: Chironomidae) of the Holarctic region – Keys and diagnoses. – Ent. scand. Suppl. **28:** 299–426

Rossaro, B. 1984. Revision of the genus *Polypedilum* Kieffer, 1912. I. Key to adult, pupae and larvae of the species known to occur in Italy. – Mem. Soc. ent. ital., Genova **62/63:** 3–23

Saether, O. 1980. Glossary of Chironomid morphology terminology (Diptera, Chironomidae). – Ent. scand. Suppl. **14:** 1–51

Townes, H. K. 1945. The nearctic species of Tendipedini (Diptera, Tendipedidae, Chironomidae). – Ann. Middl. Nat. **34**(1): 1–206